What is claimed is:

1. A method for detecting the presence or concentration of a polyhydroxyl analyte in a sample, which comprises:

a) exposing the sample to an indicator system having

i) a first recognition element capable of forming a covalent bond in a reversible fashion with said analyte, and either A) a second recognition element capable of forming a covalent bond in a reversible fashion to said analyte bound to the first recognition element, or B) a ligand element capable of interacting in a reversible fashion with the first recognition element in the absence of said analyte, said ligand element optionally further comprising a label that produces a detectable quality that is modulated by the interaction of the ligand element with the recognition element, wherein the portion of the indicator system containing said first recognition element is covalently or non-covalently linked to the portion of the indicator system containing said second recognition element or said ligand element; and

ii) a detection system which comprises at least one of A) a donor/acceptor system which produces a detectable quality that changes in a concentration-dependent manner when said indicator system is exposed to said analyte, or B) said labeled ligand element; and

b) measuring any change in said detectable quality to thereby determine the presence or concentration of said analyte in said sample.

2. The method of claim 1, wherein the indicator system has at least two recognition elements for the analyte.

3. The method of claim 2, wherein the analyte is a sugar and each recognition element is independently selected from the group consisting of boronic acid, boronate ion, arsenious acid, arsenite ion, telluric acid, tellurate ion, germanic acid, germanate ion, and combinations thereof.

4. The method of claim 3, wherein the analyte is glucose and each recognition element comprises one or more boronic acid groups.

5. The method of claim 1, wherein the indicator system has a recognition element for the analyte, and a ligand element.

6. The method of claim 5, wherein the analyte is a sugar, and the recognition element comprises one or more of the following: boronic acid, boronate ion, arsenious acid, arsenite ion, telluric acid, tellurate ion, germanic acid, or germanate ion.

7. The method of claim 6, wherein the analyte is glucose and the recognition element comprises one or more boronic acid groups.

8. The method of claim 5, wherein the ligand element is a moiety capable of forming an ester bond with the recognition element.

9. The method of claim 8, wherein the ligand element is selected from the group consisting of an aromatic diol, a lactate, an alpha-hydroxy acid, a tartaric acid, a malic acid, diethanolamine, a β-aminoalcohol, glucose,

and a polyhydroxy compound, and a vicinal hydroxy-containing compound, all optionally substituted.

10. The method of claim 1, wherein the detection system comprises a donor/acceptor system.

11. The method of claim 10, wherein the detection system comprises a fluorophore and a quenching moiety, wherein said fluorophore is either quenched or dequenched when said indicator system binds to said analyte.

12. The method of claim 1, wherein the detection system comprises said labeled ligand element.

13. The method of claim 12, wherein said labeled ligand element comprises a fluorophore, and the fluorescence of said fluorophore is modulated by the binding of said indicator system with said analyte.

14. The method of claim 10, wherein the detection system comprises at least two different fluorophores, and wherein the fluorescence of said fluorophores is modulated by the interaction of said indicator system with said analyte.

15. The method of claim 1, wherein the sample is a physiological fluid.

16. The method of claim 15, wherein the physiological fluid is selected from the group consisting of blood, plasma, serum, interstitial fluid, cerebrospinal fluid, urine, saliva, intraocular fluid, lymph, tears, sweat, and physiological buffers.

17. The method of claim 1, wherein the indicator system is exposed to the sample in solution.

18. The method of claim 1, wherein the indicator system is immobilized on or within a solid support.

19. The method of claim 18, wherein the solid support is a polymeric matrix.

20. The method of claim 1, wherein the indicator system is associated with an implantable device, and wherein step a) takes place *in vivo*.

21. The method of claim 1, wherein the measuring step takes place at substantially ambient temperature.

22. The method of claim 21, wherein the temperature is up to about 80°C.

23. The method of claim 1, wherein the indicator system comprises a residue of a compound selected from the group consisting of:

N-2-[5-(N-4-dimethylaminobenzyl)-5-[2-(borono)-benzyl]aminohexyl]-[2-(borono)benzyl]aminoethyl-4-butylamino-1,8-naphthalimide;

N-2-[4-(N-4-dimethylaminobenzyl)-[2-(borono)-benzyl]aminomethyl]benzyl-[2-(borono)benzyl]aminoethyl-4-butylamino-1,8-naphthalimide;

N-2-[5-(N-4-dimethylaminobenzyl)-5-[2-(borono)-benzyl]aminohexyl]-[2-(borono)benzyl]aminoethyl-4-[2-(2-aminoethoxy)ethoxyethyl)amino-1,8-naphthalimide;

N-(5-methoxycarbonyl-5-[3,4-dihydroxybenz-amido]pentyl)-N'-(5-fluoresceinyl)thiourea;

N-α-(3-boronato-5-nitro)benzoyl-N-ε-(4-dimethylamino-3,5-dinitro)benzoyllysine;

N-α-(3,4-dihydroxybenzoyl)-N-ε-(5-dimethylaminonaphthalene-1-sulfonyl)-lysine;

N-α-(3,4-dihydroxybenzoyl)-N-ε-(5-dimethylaminonaphthalene-1-sulfonyl)-lysine N-3-(methacrylamido)propylcarboxamide; and

N-α-(3-boronato-5-nitro)benzoyl-N-ε-(4-dimethylamino-3,5-dinitro)benzoyllysine N-3-(methacrylamido)propyl-carboxamide.

24. An indicator system which comprises a residue of a compound selected from the group consisting of:

N-2-[5-(N-4-dimethylaminobenzyl)-5-[2-(borono)-benzyl]aminohexyl]-[2-(borono)benzyl]aminoethyl-4-butylamino-1,8-naphthalimide;

N-2-[4-(N-4-dimethylaminobenzyl)-[2-(borono)-benzyl]aminomethyl]benzyl-[2-(borono)benzyl]aminoethyl-4-butylamino-1,8-naphthalimide;

N-2-[5-(N-4-dimethylaminobenzyl)-5-[2-(borono)-benzyl]aminohexyl]-[2-(borono)benzyl]aminoethyl-4-[2-(2-aminoethoxy)ethoxyethyl)amino-1,8-naphthalimide;

N-(5-methoxycarbonyl-5-[3,4-dihydroxybenz-amido]pentyl)-N'-(5-fluoresceinyl)thiourea;

N-α-(3-boronato-5-nitro)benzoyl-N-ε-(4-dimethylamino-3,5-dinitro)benzoyllysine;

N-α-(3,4-dihydroxybenzoyl)-N-ε-(5-dimethylaminonaphthalene-1-sulfonyl)-lysine;

N-α-(3,4-dihydroxybenzoyl)-N-ε-(5-dimethylaminonaphthalene-1-sulfonyl)-lysine N-3-(methacrylamido)propylcarboxamide; and

N-α-(3-boronato-5-nitro)benzoyl-N-ε-(4-dimethylamino-3,5-dinitro)benzoyllysine N-3-(methacrylamido)propyl-carboxamide.